REMARKS

1. Telephone Interview Summary

Applicant and their attorneys once again thank the Examiner for the courtesy extended during the telephonic interview on April 4, 2006. The substance of that interview has been summarized in the Remarks section of the Amendment after Final, filed April 6, 2006.

2. Nonobviousness of Claims 1-13

Claims 1-8 stand rejected. By this Amendment, claims 1 and 2 are amended, and new claims 9-13 are added. Claims 1-13 are now presented for reconsideration and allowance.

Claim 1 has been rejected under 35 U.S.C. § 103(a) as being obvious in view of U.S. Pat. No. 6,088,347 to Minn et al, in combination with U.S. Pat. No. 5,950,124 to Trompower et al. The Minn et al. patent describes spread spectrum modulation in which first and second input signals are each modulated by different direct-sequence spreading codes that have low cross-correlation with one another. The Minn et al. patent describes the well-known technique of modulating an information signal with a user-specific code (e.g. Walsh code) and a cell-specific code (e.g. PN code). For a particular information signal, the user-specific code and the cell-specific code can be different (col. 12, lines 40-43).

The Trompower et al. patent discloses dynamically modifying the transmitting or receiving PN code parameters.

Applicant respectfully submits that neither the Minn et al. patent, nor the Trompower et al patent, alone or in combination, teach or suggest the two-level spreading as claimed in independent claims 1, 10, and 12. In the two-level spreading of amended claim 1, first level spreading is applied to data information with a first level spreading code to produce a first level-spread signal, wherein the first level spreading code produces a first spreading factor of a chips per symbol interval of the data information, and second level spreading is applied to the first

level-spread signal with a second level spreading code to produce a second level-spread signal, wherein the second level spreading code produces a second spreading factor of b chips per each chip interval of the first level spreading code, such that a total spreading factor for producing the second level-spread signal is equal to a product of the first spreading factor and the second spreading factor.

In the two-level spreading claimed in claim 10, first level spreading is applied to the information signal (having a length of x symbols) with a first level spreading code having a length of y symbols to produce a first level-spread signal having a length of $x \cdot y$ symbols. Second level spreading is then applied to the first level-spread signal with a second level spreading code having a length of z symbols to produce a second level-spread signal having a length of $x \cdot y \cdot z$ symbols.

In the two-level spreading of claim 12, first level spreading is applied to the information signal with a first level spreading code having a first chip rate to produce a first level-spread signal having a second chip rate equal to a product of the bit rate and the first chip rate. Second level spreading is then applied to the first level-spread signal with a second level spreading code having a third chip rate to produce a second level-spread signal having a chip rate equal to a product of the second chip rate and the third chip rate.

A non-limiting example of the two-level spreading according to one embodiment of the invention is described in the specification in paragraph 12, and with reference to Fig. 1. Each data bit $b^{k,c}$, is spread by L_2 chips of first spreading code w^k and each of these chips is further spread by L_1 chips of second spreading code p^c. As a result, the total spreading factor is equal to the product L_2L_1. Also, as depicted in Fig. 1, in one embodiment, the spreading factor of each level of the two-level spreading can be the lengths L_1 and L_2, respectively, of the spreading codes, such that each information bit $b^{k,c}$ is actually represented by $L_1 \cdot L_2$ symbols.

Furthermore, the output chip rate is $r_{c2} = L_2 \cdot L_1 \cdot r_b$, where r_b is the bit rate of the information signal.

Applicant respectfully points out that the discussion of multiplication in col. 2, lines 23-46 of the Minn et al. patent (and cited in paragraph 1(b) of the Final Office Action) generally describes modulation in the context of an analog system. The Minn et al. patent explains that multiplication in the analog domain is equivalent to an exclusive-OR (XOR) operation for the digital (binary) domain. Note that the Background of the Invention section of the present specification (paragraph 5) describes the XOR operation as the prior art method of applying a scrambling code and a channel code in known 2-layer spreading in CDMA systems.

The Minn et al. patent does not describe applying a first spreading code and a second spreading code to produce a total spreading factor that is a product of the two individual spreading factors, as claimed in claim 1, or to produce a second level-spread signal having a length of $x \cdot y \cdot z$ symbols, as claimed in claim 10, or to produce an output chip rate equal to a product of the chip rates of each of the first and second spreading codes and the information signal bit rate, as claimed in independent claim 12. To the contrary, the Minn et al. patent states that the combined chip rate R_c is defined as the *maximum* of the Walsh code rate R_w and the PN code rate R_p (see col. 10, lines 4-9). This is characteristic of one-level spreading. In this regard, the Minn et al. patent teaches away from the two-level spreading claimed in claims 1 and 10.

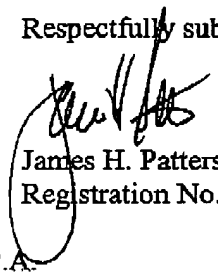
None of the other cited references, either alone, or in any combination, teach or suggest two-level spreading as claimed. Therefore, Applicant respectfully submits that a *prima facie* case for obviousness has not been made, and cannot be made against independent claims 1, 10, and 12.

Dependent claims 2-8 and 9, further define claim 1; dependent claim 11 further defines independent claim 10; and dependent claim 13 further defines independent claim 12. Therefore, these claims are also believed to be allowable.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of claims 1-13 are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



James H. Patterson
Registration No. 30,673

Customer No. 24113
Patterson, Thuente, Skaar & Christensen, P.A.
4800 IDS Center
80 South 8th Street
Minneapolis, Minnesota 55402-2100
Telephone: (612) 349-5741